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Impact of Burnout and Psychosocial Work Characteristics on Future Long-Term Sickness Absence. Prospective Results of the Danish PUMA Study Among Human Service Workers

Marianne Borritz, MD, PhD, Karl Bang Christensen, PhD, Ute Bültmann, PhD, Reiner Rugulies, PhD, Thomas Lund, PhD, Ingelise Andersen, PhD, Ebbe Villadsen, Finn Diderichsen, MD, PhD, and Tage S. Kristensen, Dr Med Sci

Objectives: The objective of this study was to examine if burnout and psychosocial factors predicted long-term sickness absence (>2 weeks) at work unit level. **Methods:** Data were collected prospectively at 82-work units in human services (PUMA cohort, PUMA: Danish acronym for Burnout, Motivation and Job satisfaction) followed up during the proceeding 18 months regarding onset of long-term sickness absence. Questionnaire data regarding burnout and psychosocial factors were aggregated at work unit level. We used Poisson regression models with psychosocial factors and burnout as predictors of long-term sickness absence for more than 18 months based on data from a national absence register. **Results:** Long-term sickness absence was predicted by psychosocial factors and by burnout at work unit level. **Conclusion:** To reduce sickness absence, organizations within human services should improve the psychosocial work environment, and equally important, the organizations should be attentive to employees with symptoms of burnout.

During the past decade, an increasing number of employees from the public sector is suffering from stress-related mental-health problems, with considerable consequences in terms of long-term sickness absence or even disability pensioning.¹⁻⁴ Stress-related mental-health problems comprise a spectrum ranging from chronic stress reactions, burnout, posttraumatic stress reactions, and minor and major depression of which burnout is the focus of this article.

Burnout is described as a particular type of prolonged occupational stress with exhaustion (physical, emotional, and mental) as its core symptom and has primarily been the focus of research in human services work.⁵⁻⁷ Thus, chronic exposure to adverse conditions (stressors) causes stress reactions in the individual, and these prolonged stress reactions result into burnout.^{5,6}

Wieclaw et al^{3,4} have shown that people who work in human service professions have a higher risk of affective and stress-related disorders than other occupations in the Danish workforce. The core

Learning Objectives

- Become familiar with the previous research on the risk of burnout in human service workers and on the psychosocial work characteristics associated with burnout.
- Summarize the new findings on the relationship between burnout, psychosocial work characteristics, and long-term sickness absence in human service workers.
- Discuss the study implications for improving the psychosocial work environment and preventing long-term sickness absence in human service organizations.

of occupations in human services is characterized and by the professional relation between employee and client (social service recipient, patient, elderly resident, pupils, inmate, etc), often involving some degree of emotional demands and unclear roles, goals, and content of work.^{5,8}

Previously, we have found specific psychosocial work characteristics, such as high level of role conflicts, low levels of role clarity, and predictability to be prospectively associated with increased risk of burnout.⁹ These findings are in line with suggestions made by Zapf et al¹⁰ that burnout research should include specific factors that are related to human service work (such as emotional demands) and to the collaboration between the human service workers (such as role conflicts and role clarity) and not be limited to the traditional factors of demand, control, and support. Even though these specific job characteristics have been pointed out as important when studying burnout, most studies to date are based on the job demand-job control model or the effort-reward model, both not including client specific factors.

Psychosocial work characteristics are known as predictors of sickness absence, too.¹¹⁻²⁴ Nevertheless, most of these studies comprise individuals from the general population or from companies without client work. Only a minority of the studies comprise individuals from the public services of which at least a part of the study populations includes human service occupations.^{12,14,24} All the three studies mentioned used aggregated measurement of the psychosocial work characteristics in an attempt to overcome the bias arising from differences in response styles between psychosocial work characteristics and health-related well-being. Labriola et al¹⁴ found that poor quality of leadership and low supervisor support predicted long-term sickness absence (>8 weeks). Virtanen et al²⁴ found that persons having distress showed increased sickness absence if working in a high-strain work environment. In previous analyses of the PUMA cohort in human services, we found that high level of emotional demands, high degree of role conflicts, and poor quality of leadership at individual level prospectively were associated with self-reported sickness absence.²²

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Relatively, few studies have studied registered long-term sickness absences as a consequence of burnout. In a meta-analysis of 20 prospective observational studies of predictors of sickness absence by Duijts et al,²⁵ burnout predicted future sickness absence. In a new study of Ahola et al,²⁶ sickness absence as a consequence of burnout has been analyzed in a Finnish population sample. They found that individuals with a high degree of burnout had a higher risk of sickness absence of >9 days compared with individuals with no burnout after adjusting for mental and physical disease and that the risk was higher for men than for women.

The study of Ahola et al and the studies by others on sickness absence as a consequence of burnout used sickness absence spells with lengths ranging from 1 to 9 days and not long-term sickness absence.^{20,25,27–29}

In earlier analyses of the PUMA cohort, we have demonstrated that burnout predicted sickness absence both regarding sickness absence days and spells at 3 years follow-up.³⁰ Nevertheless, these findings were based on self-reported sickness absence, in which spells of long-term sickness absence may be less correct. Because long-term sickness absence increases the risks of future long-term absence, exclusion from the labor market, and disability pension, long-term sickness absence seems relevant to study.^{31–33}

Overall, there seems to be a gap in the literature regarding studies on the predictive effect of burnout on registered long-term sickness absence. Moreover, to our knowledge, no studies on the impact of the relationship between burnout and specific psychosocial work characteristics on registered sickness absence have been accomplished.

This article uses a merger between the PUMA cohort and national registered data on sickness absence, allowing for precise measurement of long-term sickness absence. We prospectively investigate the impact of burnout and work unit levels of psychosocial work characteristics on registered long-term sickness absence among employees in the human service sector. The aim of this study is to investigate the impact of work unit level psychosocial work characteristics and individual level burnout on registered long-term sickness absence among employees in the human service sector. Further, we want to evaluate the influence of specific psychosocial work environment factors at the work unit on burnout and its relation with long-term sickness absence.

MATERIALS AND METHODS

Population

PUMA (Danish acronym for Study on Burnout, Motivation, and Job Satisfaction) is a 6-year prospective study, from 1999 to 2005, in five different organizations in the human service sector, including social security offices, a psychiatric prison, institutions for severely disabled people, somatic hospital wards, and homecare services in rural and urban areas. The five organizations comprised 82 work units. All occupational groups in each organization were eligible for the study. We sent survey questionnaires together with the study description and an invitation letter from the organizations to the home address of all employees in three rounds (1999 to 2000, 2002 to 2003, and 2005) during the study period. Nonresponders received two written reminders, the first after 2 weeks of nonresponse and the second—including a new questionnaire—after another 3 weeks. PUMA follows the open cohort principle, ie, employees, who joined the workforce after the baseline survey, were eligible at the follow-up survey. After collecting the last round, the PUMA cohort was linked to and followed up in the DREAM database, a national register of social transfer payments (DREAM).³⁴ The Danish Data Protection Agency (Datatilsynet) and Scientific Ethical Committees (Videnskabetiske Komitéer) in the respective counties have given approval of the study protocol.

A more detailed description on the background, design, study population, and measurements of PUMA can be found elsewhere.³⁵ For this article, we used questionnaire data from the third PUMA wave in April 2005 to June 2005 followed up with long-term sickness absence during the following 18 months.

Long-Term Sickness Absence

Data for the present article were obtained from the PUMA study and linked to the DREAM database (DREAM: Danish acronym for a national register of social transfer payments).³⁴ DREAM contains weekly information on granted sickness absence compensation for all residents in Denmark. Sickness absence compensation is given to the employer who can apply for a refund from the state after 2 weeks of sickness absence.¹⁵

Using the third PUMA wave allowed us to collect registered data on sickness absence during 18 months of follow-up covering the same seasons of year for all respondents, which was not possible during the first two rounds as both were delayed by prolonged collection periods. The sample was followed up in the DREAM register for 18 months, from August 1, 2005, to January 31, 2007. Long-term sickness absence was defined as receiving sickness absence compensation for at least 2 weeks during follow-up.

Burnout

Burnout was measured with the Copenhagen Burnout Inventory, a validated instrument on burnout.^{35,36} The Copenhagen Burnout Inventory focuses on exhaustion and is divided into three scales: 1) Personal burnout contains six items on general symptoms of exhaustion and is applicable to every working and nonworking person (How often do you think: “I can’t take it anymore?”). Work-related burnout comprises seven items on symptoms of exhaustion related to work and applies to every person in the workforce (Are you exhausted in the morning at the thought of another day at work?). Client-related burnout is based on six items on symptoms of exhaustion related to working with recipients in human services and is applicable only to people who work with clients (Does it drain your energy to work with clients?). All items have five response categories, responses are rescaled to a 0- to 100-metric, and scale scores are calculated as the mean of the items in the scale.^{35,36} The scales were divided into three categories: low (25th-percentile), medium (the 25th- to 75th-percentile), and high (the 75th-percentile).

Psychosocial Work Environment Risk Characteristics

Psychosocial work risk characteristics were measured with five scales specific for human service work derived from the Copenhagen Psychosocial Questionnaire, a comprehensive and validated instrument on work and health.^{36,37}

Four of these characteristics—role conflicts, role clarity, predictability, and quality of leadership—dealt with interpersonal relations and leadership, whereas emotional demands dealt more directly with client work. All five were found to be associated with absence and burnout at individual level in analyses of earlier PUMA rounds.^{9,22}

Role conflicts were measured with four items (ie, Do you sometimes have to do things, which ought to have been done in a different way?), role clarity with four items (ie, Do you know exactly what is expected of you at work?), predictability with two items (ie, At your place of work, are you informed well in advance concerning for example important decisions, changes, or plans for the future?), and quality of leadership with four items (ie, To what extent would you say that your immediate superior gives high priority to job satisfaction?). Emotional demands were measured

with four items (ie, Does your work put you in emotionally disturbing situations?).

To reduce bias arising from differences in response styles and burnout, we computed work unit-aggregated scores of the psychosocial factors and assigned these scores to each responding employee working in the same work unit. Work unit means of the psychosocial work characteristics were handled as independent variables in the analyses. We categorized the values into three categories: the poorest psychosocial work environment (the lowest or highest 25th-percentile regarding work unit means), the medium level (the 25th- to 75th-percentile regarding work unit means), and the most positive category (25th-percentile regarding the best work environment) as reference.

Covariates

Demographic Factors

Demographic factors (gender and age) for each employee was obtained from the employers' registers in which personal registration numbers (national identity numbers containing data of gender and date of birth) are included. Other covariates included were socioeconomic status (SES), family status, health-related lifestyle, and prevalence of self-reported disease. These variables have been found to be associated with sickness absence in other studies.^{38,39}

Socioeconomic Status

SES (based on job function and education using three groups): 1) participants with supervisory function for >50 subordinates or with advanced education (academics), 2) participants with supervisory function for <50 subordinates and/or with middle-range education, and 3) participants who were subordinates and/or had a short-term education.

Family Status

Family status (based on combining cohabiting status and having children at home to a new variable with four groups): 1) cohabiting with children at home, 2) cohabiting without children at home, 3) being single with children at home, 4) being single without children, and having children younger than 7 years.

Health-Related Lifestyle

Health-related lifestyle concerned smoking habits, alcohol consumption, physical activity, and body mass index. Smoking habits were categorized in four groups: nonsmoker, former smoker, light smoker (<15 cigarettes per day), and heavy smoker (15 cigarettes or more per day). Alcohol consumption was categorized in three groups: nondrinker, moderate drinker (≤ 14 drinks per week for women and ≤ 21 drinks for men), and heavy drinker (>14 drinks for women and >21 drinks for men). Weekly physical activity was assessed in four groups: 1) no exercise (no or light exercise for <2 hours), 2) light exercise for 2 to 4 hours, 3) moderate exercise (light exercise for >4 hours), and 4) strenuous exercise for >4 hours per week. Participants were further asked to state their height and weight, from which we calculated the body mass index.

Presence of Self-Reported Disease

Presence of self-reported disease was based on self-reported "have diseases now," regarding 12 chronic physical diseases in four categories: cardiovascular (coronary thrombosis or cardiovascular spasm, cerebral hemorrhage or cerebral thrombosis, diabetes, and raised blood pressure), respiratory (chronic bronchitis, asthma, and allergy), muscular-skeletal (backache), and other diseases (gastric ulcer, cancer, skin diseases, and illnesses of the internal female sexual organs). The respondent was identified as having a physical morbidity answering positive to at least 1 of the 12 chronic physical diseases.

Data Analysis

We examined the sickness absence rates in the population, ie, the total number of sickness absence episodes in the population divided by the total risk time in the population. The risk time was calculated as time from answering the questionnaire until first onset of sickness absence or at the end of the study period. Furthermore, subjects were excluded at the time of death, immigration, or retirement.

Multilevel Poisson regression analysis taking into account the clustered structure of the data (employees nested within work units) was used to calculate rate ratios (RR) and 95% confidence intervals (95% CI). All analyses were adjusted for demographics such as gender, age, SES, family status, and health-related lifestyle (smoking habits, alcohol consumption, sedentary lifestyle, over- or underweight, and presence of chronic physical disease). We calculated interaction (effect modification) between individual burnout and high-risk psychosocial work environment at work unit level. All statistical analyses were performed using the NLMIXED (non-linear mixed models) procedure in SAS 9.1 (SAS, Inc, Cary, NC).

RESULTS

Characteristics of the Study Population

A total of 2565 employees at 82 work units received the questionnaire. Of these, 1734 (68%) completed the questionnaire. The median work unit size was 14 employees, 25% of the work units had <10 employees, and 25% had >21. Of the 1734 persons included in the analysis, 21.4% developed long-term sickness absence (>2 weeks) during the following 18 months. Nonresponders had the same level of sickness absence as responders (results not shown). Covariates of the study population are shown in Table 1.

TABLE 1. Characteristics of the Study Population

Covariables	
Age (yr), mean (SD)	44.5 (10.2)
Women (%)	83.0
Family status	
Living with children and with spouse (%)	46.7
Living with children and without spouse (%)	7.6
Living without children and with spouse (%)	31.4
Living without children and without spouse (%)	14.2
Health-related lifestyle	
Smoking	
Nonsmoker (%)	38.7
Ex-smoker (%)	28.1
Light smoker (%)	12.8
Heavy smoker (>15 g/d) (%)	20.3
Alcohol consumption	
Nondrinker (%)	21.5
Moderate drinker (%)	72.1
Heavy drinker (%)	6.4
Exercise	
Light exercise <2 hr/wk (%)	7.1
Light exercise 2–4 hr/wk (%)	51.8
Light exercise >4 hr/wk (%)	35.8
Heavy exercise >4 hr/wk (%)	5.0
BMI	
Low weight (<18.5) (%)	1.2
Middle weight (18.5–<25) (%)	58.2
Over weight (25–<30) (%)	29.2
Heavy over weight (>30) (%)	11.1

TABLE 2. Prospective Associations for the Impact of Psychosocial Work Characteristics Aggregated at Work Unit Level on Long-Term Sickness Absence During 18-mo Follow-Up in 1734 Human Service Workers From 82 Work Units

	Emotional Demands		Role Conflicts		Role Clarity		Predictability		Quality of Leadership	
	RR	95% CI	RR	95% CI	RR	95% CI	RR	95% CI	RR	95% CI
Poor level*	2.06	(1.04–3.07)	2.18	(1.42–2.94)	1.60	(1.07–2.13)	1.70	(1.13–2.27)	1.75	(1.13–2.38)
Medium level†	1.98	(1.06–2.89)	1.43	(1.02–1.83)	1.03	(0.77–1.29)	0.99	(0.69–1.29)	1.04	(0.73–1.36)
Best level‡	1.00	—	1.00	—	1.00	—	1.00	—	1.00	—

RR indicates rate ratio adjusted for age, gender, socioeconomic status, family status, health-related lifestyle (smoking habits, alcohol consumption, sedentary lifestyle, over- or underweight, and presence of chronic physical disease).

*The 25th-percentile who responded the poorest level of each of the psychosocial factors.

†The 50th-percentile (25–75%) who responded the medium level of each of the psychosocial factors.

‡Reference, the 25th-percentile who responded the most positive (best) level of each of the psychosocial factors.

TABLE 3. Prospective Associations for the Impact of the Three-Burnout Scales on Long-Term Sickness Absence During 18-mo Follow-Up in 1,734 Human Service Workers From 82 Work Units

	Work Burnout		Personal Burnout		Client Burnout	
	RR _i	95% CI	RR _i	95% CI	RR _i	95% CI
Highest level*	2.93	(1.89–3.96)	2.30	(1.58–3.02)	1.34	(0.94–1.73)
Medium level†	1.70	(1.11–2.29)	1.30	(0.91–1.69)	1.08	(0.77–1.40)
Lowest level‡	1.00	—	1.00	—	1.00	—

RR_i indicates rate ratio adjusted for age, gender, socioeconomic status, family status, health-related lifestyle (smoking habits, alcohol consumption, sedentary lifestyle, over- or underweight, and presence of chronic physical disease).

*The 25th-percentile responded the highest (severest) level of work burnout, personal burnout and client burnout, respectively.

†The 50th-percentile (25%–75%) who responded the medium level of work burnout, personal burnout and client burnout.

‡Reference, the 25th-percentile who responded the most lowest level of work burnout, personal burnout and client burnout.

Prospective Impact of Work Unit Psychosocial Work Characteristics on Future Sickness Absence

Table 2 shows the impact of selected psychosocial work characteristics (emotional demands, role conflicts, role clarity, predictability, and quality of leadership) aggregated at work unit level and divided in three levels (poor, medium, and best) on sickness absence of >2 weeks, during the 18 months of follow-up after adjustments for a broad range of covariates.

Poor level of role conflicts showed the strongest association with future sickness absence with the RR, 2.18; CI, 1.42 to 2.94. Medium level of role conflicts, although weaker, showed a statistically significant association with sickness absence compared with the reference group (RR, 1.43; CI 1.02 to 1.83). High and medium levels of emotional demands were equally associated with increased risk of future sickness absence, with RR, 2.06; CI, 1.04 to 3.07 (high) and RR, 1.98; CI, 1.06 to 2.89 (medium). Although the associations regarding only the poor levels were statistically significant, medium levels of role clarity, predictability, and quality of leadership showed the same tendencies.

Prospective Impact of Burnout on Future Sickness Absence

Table 3 shows the RRs of high, medium, and low (reference) levels of work burnout, personal burnout, and client burnout on future long-term sickness absence after adjusting for a range of covariates. Work burnout showed RR, 2.93; CI, 1.89 to 3.96 for sickness absence risk during follow-up. The corresponding figure for high level of personal burnout was RR, 2.30; CI, 1.58 to 3.02. Medium level of work burnout was associated with RR, 1.70; CI, 1.11 to 2.29, increased risk of sickness absence. The same pattern, although statistically insignificant, was seen for client burnout.

Table 4 shows the same associations as in Table 3 regarding high, medium, and low level of the three burnout subscales. Moreover, associations after adding each of the specific psychosocial work characteristics of emotional demands, role conflicts, role clarity, predictability, and quality of leadership aggregated at work unit levels in the model.

As shown in the Table 4, adding work unit levels of the psychosocial characteristics attenuated the effect of high and medium levels of work burnout slightly, but effect on sickness absence remained significant. Regarding the impact of high work burnout, the RRs decrease from 2.93 (CI 1.89 to 3.96) to 2.67 (CI 1.80 to 3.55) after adding role conflicts in the model. The other psychosocial characteristics showed the same pattern as role conflicts—both regarding high and medium levels of all three burnout subscales, although only work burnout remained statistically significant at the medium level and personal burnout only regarding high level. The effect of client burnout showed the same patterns but remained statistically insignificant. In a final analysis, we tested for interaction (effect modification) between burnout and the psychosocial work environment but found the interaction statistically insignificant (results not shown).

DISCUSSION

This is the first study that prospectively investigates associations of burnout, specific psychosocial risk factors, and registered long-term sickness absence using multilevel analysis in a study sample representing employees from a broad range of organizations and occupations within in the human service sector in Denmark.

The study has two main findings. First, we found that poor level of specific psychosocial work characteristics aggregated at work unit level was prospectively associated with increased risk of

TABLE 4. Prospective Associations for the Impact of Work, Personal, and Client Burnout on Long-Term Sickness Absence During 18-mo Follow-Up (RR_1) and After Adding the Work-Unit Level of Psychosocial Work Characteristics (RR_2)

	Work Burnout				Personal Burnout				Client Burnout			
	RR_1	95% CI	RR_2	95% CI	RR_1	95% CI	RR_2	95% CI	RR_1	95% CI	RR_2	95% CI
Highest level	2.93	(1.89–3.96)	2.67*	(1.79–3.55)	2.30	(1.58–3.02)	2.46*	(1.75–3.17)	1.34	(0.94–1.73)	1.32*	(0.95–1.68)
			2.67†	(1.80–3.55)			2.48†	(1.77–3.19)			1.32†	(0.95–1.68)
			2.81‡	(1.89–3.72)			2.49‡	(1.77–3.21)			1.36‡	(0.99–1.73)
			2.72§	(1.83–3.60)			2.52§	(1.81–3.24)			1.32§	(0.95–1.68)
			2.77	(1.87–3.67)			2.56	(1.83–3.28)			1.36	(0.96–1.72)
Medium level	1.70	(1.11–2.29)	1.57*	(1.06–2.08)	1.30	(0.91–1.69)	1.34*	(0.95–1.72)	1.08	(0.77–1.40)	1.07*	(0.77–1.37)
			1.54†	(1.05–2.04)			1.33†	(0.95–1.70)			1.05†	(0.76–1.34)
			1.58‡	(1.07–2.09)			1.47‡	(0.84–2.11)			1.10‡	(0.80–1.41)
			1.56§	(1.06–2.07)			1.34§	(0.96–1.72)			1.10§	(0.79–1.41)
			1.57	(1.06–2.07)			1.32	(0.95–1.70)			1.10	(0.80–1.40)
Lowest (ref)	1.00		1.00		1.00		1.00		1.00		1.00	

RR_1 (model 1) indicates rate ratio of burnout at three levels adjusted for age, gender, socioeconomic status, family status, health-related lifestyle (smoking habits, alcohol consumption, sedentary lifestyle, over- or underweight, and presence of chronic physical disease).

Highest level, the 25th-percentile responded the highest (severest) level of work burnout, personal burnout, and client burnout.

Medium level, the 50th-percentile (25%–75%) responded the medium level of work burnout, personal burnout, and client burnout.

Reference, the 25th-percentile responded the lowest level of work burnout, personal burnout, and client burnout.

RR_2 (model 2): model 1 plus adjustment of work unit level of psychosocial work characteristics (*emotional demands, †role clarity, §predictability, and ||quality of leadership).

long-term sickness absence. Regarding role conflicts, the fourths (25%) of the work units corresponding poorest level had a double increase of future sickness absence (RR , 2.18; CI , 1.42 to 2.94), but poor levels of emotional demands, role clarity, and quality of leadership too were associated with increase of sickness absence during the follow-up.

Second, we found that burnout was associated with more than a double increase of long-term sickness absence during the following 1½ years (RR , 2.93; CI , 1.89 to 3.96) regarding high level of work burnout and a double increase regarding personal burnout (RR , 2.30; CI , 1.58 to 3.02)—after adjusting for a range of well-known confounders including lifestyle-factors, family and SES, gender, age, and self-reported chronic disease. The subscale client burnout showed the same but statistically insignificant patterns. Moreover, in the further analyses, we found that the impact of high level of work and personal burnout only attenuated slightly after adding work unit level of the psychosocial work factors to the model. After adding role conflicts in the model, the associations of work burnout weakened slightly from RR , 2.93 (CI , 1.89 to 3.96) to 2.67 (CI , 1.80 to 3.55).

In addition, our results showed stronger effects of work-related burnout (work burnout) than the generic burnout (personal burnout) on increase of sickness absence. These results support the findings of former findings of the PUMA study that work-related stressors as role conflicts and role unclarity seem to play an important role in development of both burnout and sickness absence.^{9,22}

Our results indicate a robust impact of burnout on future long-term sickness absence and that this impact apparently hardly seems to be influenced by the working environment of the work unit. Nevertheless, according to theory, burnout may be a step of the pathway between poor psychosocial working environment and sickness absence, early retirement, morbidity, etc.^{5,35} Although we found no statistically significant interaction between poor work environment and burnout predicting sickness absence, there may also be an indirect effect through burnout. In addition, we found that poor psychosocial work environment predicted increase of sickness absence during follow-up, which is in line with the results of Lund et al.¹⁵ Nevertheless, the mechanisms determining the interplay between poor psychosocial work environment are still largely uncovered: part of the effect is probably direct whereas a part of the effect is probably indirect, going through for example burnout.

We consider burnout as a special category of occupational stress, mostly reported in human service work, and with exhaustion as the core symptom. Ahola et al.^{40,41} have shown that severe burnout was related with depression, ie, severe burnout could lead to depression. It seems probable that burnout itself can lead to sickness absence as a result of long-lasting exhaustion. Moreover, burnout has been found to predispose depression, a well-known predictor of long-term sickness absence.^{26,41,42} The present results can also be interpreted in line with findings of Wiclaw et al.^{3,4,43} who found that employees working with people and working in emotional demanding jobs (social workers, health professions, and home care service) had a higher risk of affective and stress-related disorders including depression. These in turn are well-known risk factors for long-term sickness absence.^{11,24,26,42,44}

In earlier analyses of the PUMA study, we found individual psychosocial work environment characteristics were prospectively associated with burnout⁹ and that individual burnout had an impact on future levels of self-reported sickness absence.³⁰ In these analyses, we used multilevel analyses because we were interested in workplace level effects. An individual's response to a specific question on a psychosocial workplace factor is a function of both the objective presence of a factor and of the subjective appraisal by

the individual. If the subjective appraisal by the person is systematically associated with the study outcome—in our case, sickness absence—then the subjective appraisal would introduce a bias. For example, some individuals might have a relatively stable psychological disposition for a generally negative view of the world, including their work environment and their health. This negative view could lead to a more negative appraisal of the working conditions (for example, the perception of more psychological demands and less decision authority) and also to a more negative assessment of the individual's health, which consequently could lead to taking more days of sickness absence. In this case, the association between the psychosocial workplace factor and sickness absence is artificially increased by a psychological disposition of the individual. This is the reason that we think it is more appropriate to analyze these data aggregated to the work unit level.

In former analyses of the PUMA cohort, we found associations between burnout and self-reported sickness absence. Using register-based data of the DREAM register for measuring sickness absence ensured that the absence is medically certified, as the employer must apply for a refund from the state after 2 weeks of sickness absence to obtain sickness compensation. Moreover, to receive the compensation, the person on sick leave is obliged to contact their general practitioner to get a medical certification. This means that registered sickness absence in this study is medically certified and not caused of, for instance, recreation leave—which, as other reasons for registered absence, is separately and precisely registered in the DREAM database. On the other hand, individuals with health problems including persons with burnout symptoms may use vacation periods for recovery to avoid stigmatization of reporting repeating sick leave. In this case, our findings may be biased toward an underestimation.

Obviously, it can be argued that a substantial part of people working in human service could be especially vulnerable and, therefore, more sensitive to stressors in working life, because these types of jobs consist of demands of empathy in the relation between professional and recipient—and, therefore, might attract more sensitive persons. Nevertheless, in the former analyses of the PUMA cohort, we found that work-specific rather than client-specific factors (with exception of emotional demands) of the psychosocial work environment were associated with future burnout⁹ and that work burnout rather than client burnout predicted future increase of sickness absence.³⁰

In this study, we found that 21.4% of the study population developed long-term sickness absence of >2 weeks during the 18 months of follow-up. These results were higher than sickness absence rates of national data, of which 15.7% had >2 weeks sickness absence during the same period. Comparing our results with more similar subgroup of female employees of the social- and health-trade yielded less dramatic differences, as 19.7% of these had >2 weeks of sickness absence >2 weeks during the same follow-up period.

The PUMA cohort is not representative for the entire Danish population. Nevertheless, the PUMA cohort comprise a broad range of different organizations within the human service sector, geographically spread throughout the country, meaning that it is possible to view the PUMA cohort as representative of occupations and job groups working in the public human services in Denmark.

The strengths of this study are the prospective design, involving a range of different organizations in the human service sector corresponding a variety of occupational groups, and the adjustment of a range of well-known confounders covering SES, health behaviors, family status, and self-reported chronic disease. Bias caused of common method variance was avoided by using coworkers assessment of psychosocial work characteristics aggregated at work unit level. Further, sickness absence was measured

with national register recorded sickness absence, which has proven a precise measurement of long-term sickness absence.

CONCLUSION

To reduce sickness absence, organizations within human services should improve the psychosocial work environment, especially reduce role conflicts, and improve management of high emotional demands, and at least as important, the organizations should be attentive to employees with symptoms of burnout to prevent long-term sickness.

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